PARTICULATE AIR POLLUTION, MYOCARDIAL INFARCTION AND NEIGHBORHOOD, DEPRIVATION ─ A CASE-CROSSOVER ANALYSIS

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Background: Large multi-city studies conducted in the United States and in Europe have demonstrated that short-term exposure to airborne particulate matter is associated with an increase in daily mortality and hospital admissions for cardiovascular diseases**.** Several sub-group of the population are recognised to be more vulnerable, specifically disadvantaged groups.

Objectives: To evaluate whether socioeconomic status (SES) modified the short-term association between PM_{10} and onset of myocardial infarction (MI) in France.

Methods: The study population comprised all MI events (*n* = 2140) occurring among adults aged 35-74 years in Strasbourg (France) during years 2000-2007. SES was estimated at French census block level using a deprivation index classified into five categories. Hourly PM_{10} concentrations were modeled using the ADMS-Urban air dispersion model. A time-stratified case-crossover analysis was performed to estimate the associations between daily PM_{10} concentrations and MI events, stratifying by neighborhood deprivation category. Different exposure lags were tested for PM_{10} concentrations: lag01, average of the same and previous day, lag02, average of the same and 2 previous days and lag03 or the same and 3 previous days.

Results:A significant influence of neighborhood SES was found with a greater PM_{10} effect among subjects living in the most deprived neighborhoods. The relative excess of MI risk per 10-µg/m^3 increase in PM_{10} ranges between 15% for lag01 (95%IC [1,1%;30.8%]) and 18% ([3.1 to 37.1) for lag02, but only in the most deprived census blocks (p ,for heterogeneity between neighborhoods SES categories ranges from 0.04 to 0.07 across lags).

Conclusion:These findings suggest a strong differential susceptibility according to SES related factors. This might be due to pre-existing health conditions that render people living in more deprived areas more frail, to exposure in other microenvironments that add to the stress due to ambient air (e.g. poor housing, workplace pollution, commuting time) or to other unknown vulnerability factors.

Key words: air pollution; coronary heart disease; neighborhood; socioeconomic status; small-area analysis